WHAT IS CLAIMED IS:

1. A method of processing a metal layer on a substrate comprising the steps of:

a) providing a substrate;

b) disposing said substrate in a chamber including a chamber wall and a dielectric member supported by the chamber wall;

c) introducing a processing gas into the chamber of step (b);

d) passing processing power through the dielectric member and into the chamber of step (b) for processing a metal layer on the substrate in a plasma of the processing gas and to produce processing power-blocking materials which are capable of depositing on the dielectric member and reducing the efficiency of processing power passing through the dielectric member and into the plasma within the chamber; and

e) essentially preventing the processing power-blocking materials from depositing on the dielectric member.

2. The method of Claim 1 wherein said essentially preventing step (e) comprises heating a surface of the dielectric member to a temperature which essentially prevents the processing power-blocking materials from depositing on the surface of the dielectric member.

3. The method of Claim 1 wherein said processing power-blocking materials include a capability of forming on a surface of the dielectric member a deposit whose conductivity increases as the thickness of the deposit decreases.

4. The method of Claim 2 wherein said processing power-blocking materials include a capability of forming on a surface of the dielectric member a deposit whose conductivity increases as the thickness of the deposit decreases when the temperature of the dielectric member increases.

5. The method of Claim 1 wherein said processing power-blocking materials comprise electrically conductive products.

6. The method of Claim 2 wherein said processing power-blocking materials comprise electrically conductive products.

7. The method of Claim 4 wherein said processing power-blocking materials comprise electrically conductive products.

8. The method of Claim 2 wherein said temperature is greater than about 150°C.

9. The method of Claim 4 wherein said temperature is greater than about 225°C.

10. The method of Claim 1 wherein said processing power-blocking material comprises an element selected from the group consisting of platinum, copper, aluminum, titanium, ruthenium, iridium and mixtures thereof.

11. The method of Claim 1 wherein said substrate including said metal layer comprises a semiconductor wafer.

12. The method of Claim 1 wherein said dielectric member includes a generally dome-shaped structure.

13. The method of Claim 12 wherein said processing power is selected from the group consisting of RF power, magnetron power, microwave power, and mixtures thereof.

14. The method of Claim 1 wherein said chamber includes an inductively coupled RF plasma of the processing gas.

15. The method of Claim 1 wherein said processing of said metal layer on the substrate is selected from the group consisting of etching said metal layer and depositing said metal layer.

16. The method of Claim 3 wherein said processing power-blocking materials comprise platinum, and said processing of said metal layer comprises etching a platinum layer.

17. A method for preventing a deposit of materials whose conductivity increases as the thickness of the deposit decreases comprising:

a) providing a chamber including a chamber wall supporting a dielectric member and containing at least one substrate and a plasma processing gas for processing at least one substrate;

b) introducing processing power through a dielectric member and into the chamber for processing the substrate and producing materials which are capable of forming a deposit on a surface of the dielectric member wherein the deposit would include a conductivity which increases as the thickness of the deposit decreases; and

c) heating the surface of the dielectric member to a temperature greater than about 150°C to essentially prevent the produced materials from depositing on the surface of the dielectric member.

18. The method of Claim 17 wherein said produced materials comprise electrically conductive products.

19. The method of Claim 17 wherein said processing power is selected from the group consisting of RF power, magnetron power, and mixtures thereof.

20. The method of Claim 17 wherein said processing power is selected from the group consisting of microwave power, magnetron power, and mixtures thereof.

21. The method of Claim 17 wherein said produced materials comprise an element selected from the group consisting of platinum, copper, aluminum, titanium, ruthenium, iridium and mixtures thereof.

22. The method of Claim 18 wherein said produced materials comprise an element selected from the group consisting of platinum, copper, aluminum, titanium, ruthenium, iridium and mixtures thereof and said deposit would include a conductivity

which increases as the thickness of the deposit decreases when the temperature of the surface of the dielectric member increases.

23. The method of Claim 17 wherein said processing of the substrate comprises processing a metal layer on the substrate.

24. The method of Claim 23 wherein said substrate comprises a semiconductor wafer.

25. The method of Claim 17 wherein said dielectric member includes a generally dome-shaped structure.

26. The method of Claim 25 wherein said processing power is selected from the group consisting of RF power, magnetron power, microwave power, and mixtures thereof.

27. The method of Claim 17 wherein said chamber includes an inductively coupled RF plasma of the processing gas.

28. The method of Claim 23 wherein said processing of said metal layer is selected from the group consisting of etching said metal layer and depositing said metal layer.

29. The method of Claim 23 wherein said processing power-blocking materials comprise platinum, and said processing of said metal layer comprises etching a platinum layer.

30. A method of etching a platinum layer disposed on a substrate comprising the steps of:

a) providing a substrate supporting a platinum layer;

b) disposing the substrate of step (a) in a chamber including a chamber wall supporting a dielectric member and containing a processing gas;

c) heating an interior surface of the dielectric member to a temperature to essentially prevent platinum by-products produced from etching the platinum layer in a plasma of the processing gas from forming a deposit on the interior surface of the dielectric member and reduce the efficiency of processing power passing through the dielectric member and into the plasma of the processing gas; and

d) etching the platinum layer in a plasma of the processing gas to produce an etched platinum layer and said platinum by-products of step (c) without any of said platinum by-products forming a deposit on the interior surface of the dielectric member.

31. The method of Claim 30 wherein said etching step (d) comprises transmitting processing power through the dielectric member and into the plasma processing gas with essentially no reduction in efficiency of processing power passing through the dielectric member and into the plasma processing gas.

32. The method of Claim 30 wherein said temperature of step (c) is greater than about 150°C.

33. The method of Claim 31 wherein said temperature of step (c) is greater than about 150°C.

34. The method of Claim 30 wherein said platinum by-products of step (d) comprise electrically conductive products.

35. The method of Claim 33 wherein said platinum by-products of step (d) comprise electrically conductive products.

36. The method of Claim 30 wherein said platinum by-products of step (d) are capable of forming a deposit having a conductivity which increases as the thickness of the deposit decreases.

37. The method of Claim 35 wherein said platinum by-products of step (d) are capable of forming a deposit having a conductivity which increases as the

thickness of the deposit decreases when the temperature of the interior surface of the dielectric member increases.

38. The method of Claim 30 wherein said processing gas of said plasma of step (d) is selected from the group consisting of argon, oxygen, chlorine and mixtures thereof.